

ABSTRACT

Extraordinary piezoconductance, or change in conductance with strain or pressure, is observed in a hybrid metal-semiconductor device formed from a semiconductor thin film and an adjacent metal shunt fabricated on a semi-insulating substrate. The device includes electrodes for applying a current to the device and for measuring a resulting induced voltage. Strain that is induced in the device, including at the interface between the semiconductor and the metal shunt, changes the resistance at the interface. The device can be used to measure strain or environmental conditions such as pressure or temperature. A sensor using the device includes a frame with a thin membrane on which the device is carried. Deformations in the membrane are transferred to the device to induce strain in the device.